

IN THE CLAIMS:

Please AMEND claims 1 and 11, as follows. For the Examiner's convenience, all claims currently pending in this application have been reproduced below:

1. (Currently Amended) An electron gun comprising:

a cathode portion which emits electrons;

an anode portion which has an aperture and accelerates the emission electrons;

a bias portion which is arranged between said cathode portion and said anode portion and controls trajectories of the emission electrons so as to form a crossover between the bias position and the anode portion;

a shielding portion which is arranged below said anode portion and shields some of the emission electrons; and

a cooling portion which ~~cools~~ is arranged at said shielding portion for cooling said shielding portion,

wherein said ~~bias~~ shielding portion includes a tilt portion tilting with respect to an incident direction of the emission electrons becoming incident on said shielding portion, and includes a closing portion located between the tilt portion and the anode portion, said closing portion inhibiting the electrons reflected by the tilt portion from passing through the aperture of the anode portion.

2. (Original) The gun according to claim 1, wherein a top surface of said cathode portion is formed of a hemisphere or a hemispherical member.

3. (Previously Presented) The gun according to claim 1, wherein said shielding portion and said cooling portion are integral.

4. (Previously Presented) The gun according to claim 1, wherein said shielding portion and said cooling portion are separable, said shielding portion is made of a high melting material, and a low melting material is interposed between said shielding portion and said cooling portion.

5. (Original) The gun according to claim 1, wherein said cooling portion includes an insulator, and a cooling medium having a predetermined resistance is passed through said cooling portion.

6. (Original) The gun according to claim 5, further comprising a detecting portion which detects the electrons becoming incident on said shielding portion, and a control portion which controls an application voltage on the basis of a detection result of said detecting portion.

7. (Previously Presented) The gun according to claim 1, wherein an electrode is provided between said anode portion and said shielding portion, and a voltage is applied to said electrode.

8. (Previously Presented) The gun according to claim 1, wherein said electron gun comprises a plurality of electron guns arrayed in a single chamber.

9. (Original) The gun according to claim 8, wherein said plurality of arrayed electron guns respectively include detecting portions each of which detects the electrons becoming incident on said shielding portion, and control portions each of which controls an application voltage on the basis of a detection result of said detecting portion, said control portions being controlled independently of each other.

10. (Previously Presented) An exposure apparatus comprising:
an electron gun according to claim 1, wherein said electron gun exposes a substrate with an electron beam emitted from said electron gun.

11. (Currently Amended) An electron beam exposure apparatus comprising:
an electron gun including a cathode portion which emits electrons, an anode portion which has an aperture and accelerates the emission electrons, a bias portion which is arranged between said cathode portion and said anode portion and controls trajectories of the emission electrons so as to form a crossover between the bias portion and the anode portion, a shielding portion which is arranged below said anode portion and shields some of the emission electrons, and a cooling portion which ~~cools~~ is arranged at said shielding portion for cooling said shielding portion; and

a stage which moves in holding a substrate to be exposed by using the emission electrons,

wherein said shielding portion includes a tilt portion tilting with respect to an incident direction of the emission electrons becoming incident on said shielding portion, and includes a closing portion located between the tilt portion and the anode portion, said closing portion inhibiting the electrons reflected by the tilt portion from passing through the aperture of the anode portion.

12. (Previously Presented) A device manufacturing method comprising the steps of:
exposing a substrate using an electron beam exposure apparatus according to claim 11; and
developing the exposed substrate.